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# THE EFFECTS OF EXCHANGE RATE POLICY ON CAMEROON'S AGRICULTURAL COMPETITIVENESS

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AFRICAN ECONOMIC RESEARCH CONSORTIUM

CONSORTIUM POUR LA RECHERCHE ECONOMIQUE EN AFRIQUE

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# The effects of exchange rate policy on Cameroon's agricultural competitiveness

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## Abstract

The paper analyses the effects of trade and exchange rate policies on Cameroon's agriculture. Theoretical models and formulas are developed for empirical analysis. The calculated relative prices and indexes estimates of the degree of over-valuation of the real exchange rate and regression analysis including elasticity estimates show that these policies have been the major cause of the deterioration of Cameroon's agricultural competitiveness. The paper demonstrates the link between real exchange rates and agricultural performance. Besides poor price incentives due to government's intervention — and failure to intervene when appropriate — the lack of non-price incentives is found to hinder the development of the agricultural sector.

The paper concludes by recommending the removal of these constraints, and intervention through devaluation and the maintenance of a realistic exchange rate, export tax elimination, reduction of import taxes and increase in public expenditure in the agricultural sector. It also suggests alternative ways of raising government revenue.

# I. Introduction

Since 1986, Cameroon has been declining into a deep economic crisis. GDP fell by 2% in 1986/1987 and by 8.5% in 1987/1988. The agricultural sector the main support of the economy— has also declined. The causes have been both external and internal. The external causes are mainly the fall in petroleum and major agricultural commodity prices on the world market. On average, the petroleum price per barrel dropped by 2% and cocoa and coffee prices dropped by 17% and 35%, respectively. By 1987, prices of all agricultural exports had declined substantially. The fixed parity of the CFA franc with the French franc partly contributed to the over-valuation of the Cameroon's currency. And with the fall of the US dollar, in which Cameroon's exports are dominated, Cameroon's economic situation worsened as the external balance came under increasing pressure.

All this has been coupled with internal structural problems that were (and are still) aggravated by public mismanagement. This is partly reflected in the high current account deficit, high external debt coupled with accumulation of domestic civil servants' salary arrears and the critical financial situation of the parastatals. Cameroon's economy seems to be characterized by a high cost structure; the general level of domestic prices seems to be higher than world prices. In terms of foreign exchange, imported financial products tend to be much lower in cost than domestic products as a result of high labour costs, low productivity and inefficient production methods. Also, Cameroon labour productivity is much lower than that of other developing countries of Latin America and Asia. Exports are mainly limited to primary commodities and lightly transformed products that depend mainly on the protected domestic market. Even the domestic market has now been invaded by cheap goods from neighbouring countries, particularly Nigeria. So Cameroon's exports have become less competitive in the world markets. This type of pressure has caused a drastic decline in exports as well as agricultural production, while imports have been encouraged.

The importance of agriculture, in terms of employment, gross domestic products (GDP), food, tradeable component and foreign exchange earnings, implies that such macroeconomic policies as commodity exports and import taxes, producer prices and general price level have tremendous impact on the agricultural sector and also on the economy as a whole. Some of these effects are direct, such as specific crop export taxes; some are indirect, such as the effects of the over-valuation of domestic currency vis-a-vis other currencies.

The main objective of this study is therefore to identify and quantify the effects of exchange rate and trade policy on the structure of exports and agricultural exports incentives, agriculture output and the anti-export bias against agriculture.

In section II we trace the background of the monetary cooperation agreement with France and discuss how the over-valuation of the CFA francs has become a concern as a result of the difficulties of maintaining a realistic exchange rate. Section III looks at the different studies that have been done in this area and demonstrates that little or nothing has been done on Cameroon. In section IV we examine the structure and changes in the agricultural sector and discuss agricultural constraints. Theoretical models and formulas are derived in section V and empirical results are analysed in section VI. The paper concludes in Section VII with policy implications.

## II. Background

The Communaute Financiere Africaine (CFA) countries belong to a monetary cooperation agreement with France. In this arrangement the CFA franc is pegged to the French franc. The whole zone pools its foreign exchange reserves together, with an operational account with the French treasury that guarantees the convertibility of the CFA franc. They have a common exchange control system. In the Banque des Etats de l'Afrique Centrale (BEAC) zone, Cameroon's economy accounts for about half the aggregate GDP of the total currency area.

Up to the early 1980s the monetary arrangement of the franc zone seemed to have enforced some monetary stability much openness and convertibility, which were supposed to have led to more direct investments and a strong regional currency. In the 1970s the situation caused no alarm partly because capital inflow covered the disequilibrium in balance of payments.

That is , the value of these currencies, as reflected in the exchange rates in the CFA countries, was not a concern. However, recently the problem of these currencies being over-valued has been brought into focus. The debt crisis has deepened, capital inflow has decreased to negligible amounts, exports have declined sharply and foreign exchange shortages have become common. World commodity prices declined very sharply in 1987 as compared to the situation in 1985. Cameroon's situation has worsened as the US dollar has continuously depreciated against other major currencies (including the French franc, which did not depreciate as much as the US dollar). Thus, Cameroon's exports, especially agricultural exports, further lost their international competitiveness. In the 1960s and 1970s the French franc was weak and so the franc zone was more competitive, but as the French franc rapidly appreciated relative to the dollar starting in the late 1970s, the franc zone became less competitive. In fact, the anglophone economies notably Nigeria and Ghana, have improved and have become more competitive. Nigeria has become so much more competitive, partly because of CFA over-valuation, that no local Cameroon products can compete with its imported equivalent without protection. And the franc zone including Cameroon is in both economic and political crisis. The institutional and economic structures were exposed by the collapse of commodity prices and weakened further by external and internal debt problems.

The negative impact of the over-valued CFA franc affected the export sector as much as the agricultural sector, and consequently the whole economy. Hence, over-valuation of the CFA franc has now become a great concern. Studies have shown that many countries maintain over-valued currrencies and use their marketing boards to depress producer prices. These studies on African economies emphasize only the explicit tax imposed by the marketing boards and disregard the implicit taxation imposed by the

over-valued exchange rate. But both explicit and implicit taxes have the net effect of pushing the "domestic prices of commodities much below their border price level". So the production of those export commodities is further reduced by the combined effects of export taxes and over-valued currency, the high cost of production and the domestic price level.

## Exchange rate and macroeconomic policy issues

Besides protection, export taxes and subsidies, a country can use exchange rate policy to change the level of domestic production and industrialization as well as of exports. The exchange rate policy is the central tool of trade policy with far-reaching effects, since the expansion of exports is effectively linked to export and its relationship with domestic prices and costs. In real terms, people produce goods and services if they find these activities rewarding. In producing for exports and import-competing goods and services, the foreign exchange rate plays a crucial role, as it also relates to domestic prices and costs. When the real rate of exchange is such that imports are made more expensive, then the production of import-substitution goods and services for export is encouraged. But domestic production can be discouraged if imports are made cheap, as in the case of Cameroon.

However, despite the importance of an appropriate real exchange rate, it is not easy to maintain a favourable real exchange rate since it involves also the macro-level management of the economy. For instance, in narrowing the gap between its official and parallel exchange rates, Ghana carried out a step-wise devaluation of its official nominal exchange rate concurrently with fiscal reforms in order to reduce the deficit. But Sierra Leone met with great difficulties in trying to close the gap between the official and parallel market exchange rates. Sierra Leone faced a major problem of fiscal imbalance (World Bank, 1988, p. 88). In fact a rise in inflation may reflect a major expansion in budget deficits. Fiscal reform seem to be a major requirement for the unification of dual exchange rates. But this goes further than that, because the institutions — including political, financial and administrative - could also be major determinants in exchange rate and fiscal policy changes or reform. The effects of the change in the exchange rate on the economy may depend on the total policy package.

As in 1988, the African franc zone's biggest economies (Cameroon and Ivory Coast) faced many economic problems resulting in heavy accumulation of the deficits in the operational account. It is estimated that France spent 20 billion French francs to support the CFA franc parity (Van de Walle, 1991, p. 393). In 1993 Cameroon carried out two sharp salary cuts in the public sector in attempt to reduce its fiscal imbalance.

Besides devaluation, it now seems that the question of delinking the CFA franc from the French franc can be discussed openly. The discussion is more important now in the context of a potential European monetary union, as well as the economic situation of the franc zone. However, the monetary relationship may in the long run depend on the domestic socio-economic and political situation of the respective CFA franc countries.

# III Literature review

This study is important and useful for major policy implications. Agriculture is the main support of Cameroon's economy, but the country's agricultural production and exports have been falling. Even oil production is falling, which underscores the importance of agriculture in the economy. Different ways must be sought to greately increase the rate of growth of agriculture and to make that growth sustainable. This is especially important considering agriculture's large share of GDP and the labour force. African agricultural policies in general have been characterized by:

- import tarifffs, import substitution and protection policies against imports competing with domestic production;
- maintenance of over-valued exchange rates and the imposition of import restriction schemes;
- direct suppression of producer prices through taxation and stabilization mechanisms (Krueger, 1988, and Krueger *et al*, 1991).

Those policies have tended to inhibit agricultural and export growth in economies dominated by agriculture. Yet very little work has been done on the impact of over-valued exchange rates on African agriculture. Specifically, not much has been done in the case of Cameroon.

Since the breakdown of the Breton Woods system of maintenance of exchange rate policies, African countries have experienced exogenous changes in their exchange rates partly caused by fluctuations in the major currencies of developed countries. This has become a major source of external economic shocks, since African countries have strong links with developed countries in trade and payments, as well as monetary arrangements. The misalignment/realignment of developed country exchange rates, frequently alter the value of African countries' currencies vis-a-vis the currencies of their trade partners. These exogenous factors affect African countries' foreign trade and domestic economies mainly through changes in relative prices and resource flows.

In fact, currency floating has complicated policy in African countries as much as it has presented an opportunity for African countries to carry out a more active exchange rate policy. The countries in the franc zone tend to have a passive exchange rate policy, despite the general agreement that these currencies are over-valued and that over-valuation contributes to the distortion of domestic incentive structures. Usually the exchange rate policy becomes an important trade instrument as the economy becomes more trade oriented; in such cases, the real exchange rate plays a crucial role. Hence real exchange rate over-valuation may tend to explain partly the decline of agricultural exports. The exchange rate policy and the relationship between the real exchange rate and price incentives are becoming a major focus in the study of African economic and agricultural

decline (Fosu, 1992; Tshibaka, 1991; Oyejide, 1986).

Previous studies have shown that developing countries do maintain over-valued currencies, but have emphasized only the direct impact of tax imposed by the marketing boards and neglected the indirect taxation imposed by over-valuation. Elbadawi (1991) tries to distinguish the direct and indirect effects of these policies on Sudan's agriculture. Very little attention (Fosu, 1992) has been placed on the link between real exchange rate and agricultural price incentives in African economies, and the agricultural exports response to the real exchange rate.

Studies such as Krueger *et al.* (1991), Devarajan and de Melo (1978), Devarajan *et al.* (1991) failed to provide estimates of the responsiveness of the real exchange rate to agricultural price incentives. In fact, useful policy parameters such as relevant elasticities have not been calculated for Cameroon, although attempts have been made in other countries (Bautista and Valdes, 1993). In this study we try to provide some of these estimates. Most discussions (Devarajan and de Melo, 1987; Devarajan *et al*; 1991) on the economies belonging to the CFA franc zone have ruled out the possibility of those countries changing the current fixed parity that exists between the CFA franc and the French franc. Yet this is very likely to happen.

For example Devarajan and de Melo examined the adjustments of three countries, including Cameroon, within the CFA franc zone and concluded that macroeconomic adjustments in these countries could be done by influencing the real exchange rate, instead of the nominal exchange rate. This is because the adjustment in these countries had different results. The monetary arrangement between France and her former colonies has been an unchanged fixed parity of 1 French franc to 50 CFA franc since 1948; such that nominal changes in the CFA franc are caused by changes or fluctuations of the French franc. (In fact the French franc has arbitrarily been devaluated four times, in 1969, 1981, 1982 and 1983 (Van de Walle, 1991). Now, the devaluation of the CFA franc remains only a question of time.

In studying the effects of the real exchange rate on agricultural incentives, as well as determinants, a two-sector model developed by Dornbusch (1974) has been expanded to three sectors, exportables, importables and non-tradeables.

Using this model some authors (Mundlak and Carallo, 1977) have argued that real exchange rate over-valuation has contributed little to the poor performance of agriculture in developing economies. Yet the dominant role played by agriculture in these economies, particularly in all three sectors, makes it necessary for realistic exchange rate policies to be adopted, so as to encourage agricultural growth. Because of the large share of agriculture in GDP and the labour force, changes in the relative prices of tradeable and non-tradeable goods due to trade and exchange rate policies can have great effects on agriculture. In our study, we examine the price incentive structure of the crucial sector in the economy, particularly the agricultural sector, bringing out the response of relative prices of these sectors to changes in the real exchange rate.

There is growing discussion on the modelling of real exchange rate (RER) and export output. The question is whether RER indirectly affects output through relative prices or directly affects output. For instance, in his agricultural export response model,

Jaeger (1991) used both the producer price and real exchange rate as the independent variables. By using the RER as a regressor, it is seen as directly affecting agricultural exports because it is used as a proxy for incentives. RER alters the relative prices and so affects export competitiveness. But Fosu (1992) argued that RER of domestic currency hardly affects the agricultural exports directly. The influence of RER is through the incentive structure. Hence RER cannot be used as an explanatory variable in an agricultural export supply response equation; such models are equally flawed when they include both RER and producer price as regressors. There is likely dependence of relative price on RER (Fosu, 1992), but this situation depends on the definition of RER. Regarding RER as reflecting the purchasing value of the domestic currency relative to the foreign currency, we could model the RER as affecting the given output through the relative prices.

# IV. Research problems and objectives

Up to December 1993, Cameroon's currency (CFA) has been over-valued vis-a-vis the major currencies and in particular the US dollar. This seems to have greatly affected the country's agricultural production as well as its exports. And given that agriculture is the main support of the economy, it has become a major concern to all interested in the country's economy in particular and sub-Saharan African economy in general. But there exists little or no quantitative knowledge of the different determinants of agricultural outputs and the real exchange rate in the CFA franc countries, particularly in the case of Cameroon. It is believed that the over-valued currency has negative effects on agriculture, consequently on the economies of the CFA franc countries. But there has been no quantitative analysis of any kind of the impact of over-valued exchange rates. No detailed study on Cameroon's economy has been done to find out, for instance, the extent to which over-valuation taxes agricultural exports or discourages both agricultural exports and exports as a whole. Nor has any study determined the extent of the CFA franc's over-valuation vis-a-vis the currencies of its trade partners and the US dollar. The trend of the over-valuation has not been shown or calculated.

Moreover, a major proportion of exports is goods produced by the farm sector, while imports are mostly consumed by the non-farm sector especially the urban elites. To that extent, an over-valued currency tends to tax the farm sector and subsidize the non-farm sector. The net effect is that resources, especially income, may be shifted from the rural to the urban sector; thus the over-valued currency may aggravate rural poverty and increase the inequality between rural and urban sectors. Since the rural sector is taxed implicitly for the benefits of urban sectors, knowing by how much the gainers gain and the losers lose is very important for policy implications. In fact, it is worth noting that those who stand to gain most from realistic policy changes are small holders/producers and the urban poor who are politically diffuse and weak. Those who stand to lose are politically powerful.

Interest has now grown within African countries on the use of the exchange policy to change the relative incentive structure for export promotion from previous import substitution strategy or even passive exchange rate policy. It is necessary to identify and quantify the crucial parameters in agricultural policy formation. There is very little knowledge of how trade price and exchange rate policy changes could affect relative prices, output levels, trade flows or resource shifts. The present study is therefore very relevant in helping to fill this gap in our knowledge and provide policy relevant information. Specifically this study:

- Estimates the effects of exchange rate and other trade policies on prices of export crops and looks at the trade-off between food crops and export crops;

- Estimates the real exchange rate and assesses the degree of over-valuation of the exchange rate; and
- Measures the impact of the exchange rate on Cameroon's agricultural export competitiveness;

# V. Structure and changes in agriculture

Cameroon national accounts classify agriculture as the primary sector that includes livestock, fishing, forestry and crops. The crop sub-sector is further divided into two other sub-sectors -crops produced mainly for export (export crops) and crops produced mainly for domestic consumption (food crops). On the whole, the share of agriculture in GDP has been declining and was at its lowest during the oil boom (Table 1). Our study focuses on the crop sub-sector of the agriculture sector. The crop sub-sector is the largest of the agricultural sub-sectors, accounting for a yearly average of 75% of agriculture value. Livestock is the second highest contributer to the total value of agriculture, followed by forestry and then fishing (Table 2).

The broad categorization of crops into food and export groups may be misleading in the case of certain food crops that are also export crops. The main traditional export crops include cocoa, coffee, cotton, palm products, log and wood products and bananas. But of late, much palm oil and bananas have been locally consumed, while other food crops such as yams, rice, plantains, maize and millet have been exported particularly to neighbouring countries. However, what is clear is nearly all the crops contain some traded portion. The food crop traded portion may not be known exactly, partly because of much unrecorded cross-border trade.

The different components of the agricultural sector have changed over time, with the food sub-sector continuing to provide the major agricultural contribution to GDP. Over the period 1983-1988 food crops accounted for about 54% of the value added in agriculture, export crops about 12%, livestock and fishing, 16%, and forestry, 9%. (See Table 2 and 3)

Export crops have contributed up to 87% of total exports, though during the oil boom the proportion declined to 27%. With the decline in oil production, the share of agricultural crop exports seem to be on the increase, reaching 48% in 1988 (Table 4). Within the traditional export crops, cocoa and coffee have the greatest share, but their shares have been declining steadily (Table 4).

**Table 1**: Agricultural share in GDP (percentages) 1962-1991

| | | | | | | |
|---|---|---|---|---|---|---|
| Year | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 |
| Share | - | - | 42.3 | 41.3 | - | 33.0 |
| Year | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 |
| Share | - | - | - | - | - | 3.41 |
| Year | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 |
| Share | 34.43 | 34.33 | 33.07 | 33.4 | 33.42 | 2.51 |
| Year | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
| Share | 31.6 | 32.0 | 28.7 | 28.0 | 27.2 | 23.2 |
| Year | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 |
| Share | 22.5 | 21.0 | 22.2 | 25.6 | 30.5 | 29.0 |
| Year | 1990 | 1991 | 1992 | 1993 | | |
| Share | 29.0 | 33.4 | - | - | | |

Sources:

(1) World Bank, Cameroon Country Economic Memorandum, Washington, D.C, 1984.
(2) World Bank, Cameroon Country Economic Memorandum, Washington, D.C., 1987.
(3) PNUD, BANQUE MONDIALE, Donnees Economiques et Financieres sur L'Afrique, Washington, D.C. 1990 and calculations based on central statistics data

**Table 2**: Contribution of agriculture to GDP at constant 1975 prices (in billion CFAF)

| | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Food crops | 66.5 | 68.7 | 73.6 | 76.9 | 80.0 | 84.6 | 93.6 | 94.3 | 83.9 | 83.6 | 84.4 | 83.8 |
| Export Crops | 50.2 | 55.6 | 53.7 | 55.4 | 56.3 | 49.7 | 51.2 | 55.5 | 55.9 | 60.4 | 60.4 | 61.8 |
| Live-stock | 25.2 | 26.5 | 27.9 | 29.5 | 30.5 | 31.7 | 33.8 | 29.1 | 29.0 | 28.9 | 30.4 | 30.0 |
| Fishing | 4.2 | 4.9 | 5.2 | 4.8 | 4.1 | 4.01 | 4.9 | 3.9 | 3.4 | 2.8 | 3.4 | 3.7 |
| Forestry | 10.7 | 12.4 | 14.3 | 16.8 | 14.3 | 16.8 | 15.6 | 17.4 | 29.3 | 29.0 | 29.9 | 30.9 |
| Total Agriculture | 156.8 | 168.1 | 174.7 | 183.4 | 185.2 | 186.8 | 199.1 | 200.2 | 201.5 | 204.7 | 208.5 | 210.2 |

| | 1983/84 | 1984/85 | 1985/86 | 1986/87 | 1987/88 | 1983/88 Average | 1988/89 | 1989/90 | 1990/91 | 1991/92 | 1992/93 | 1988/92 Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Food crops | 244.8 | 247.2 | 292.8 | 320.8 | 320.8 | 285.3 | 444.3 | 413.0 | 404.2 | 384.7 | 374.7 | 404.2 |
| Export crops | 139.9 | 116.7 | 107.4 | 98.9 | 98.9 | 112.4 | 202.7 | 132.7 | 129.3 | 115.5 | 131.0 | 142.2 |
| Live-stock | 76.7 | 72.5 | 81.7 | 81.5 | 81.5 | 78.8 | 146.6 | 153.0 | 149.7 | 134.6 | 133.3 | 143.4 |
| Fishing | 6.2 | 4.3 | 5.3 | 5.7 | 6.2 | 5.5 | 4.4 | 4.7 | 4.7 | 3.1 | 3.1 | 4.0 |
| Forestry | 48 | 53.9 | 47.6 | 46.1 | 48.4 | 49.0 | 118.8 | 139.0 | 158.5 | 127.0 | 124.1 | 133.4 |
| Total Agriculture | 515.6 | 494.6 | 534.8 | 553.0 | 555.8 | 531.0 | 916.8 | 842.3 | 846.5 | 764.9 | 766.2 | 827.2 |

Source: Cameroon Country Economic Memorandum, 1987, Table 2; National Accounts Cameroon Agriculture Sector Report, World Bank, November 1989; Ministry of Agriculture.

**Table 3**: Percentage of sub-sectors in agriculture

Percentage of sub-sector in agriculture

| | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 |
|---|---|---|---|---|---|---|
| Food % | 42.4 | 40.9 | 42.1 | 41.9 | 43.2 | 45.3 |
| Export% | 32.0 | 33.1 | 30.7 | 30.2 | 30.4 | 26.6 |
| Total crops | 74.4 | 74.0 | 72.8 | 72.1 | 73.6 | 71.9 |

| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|
| Food % | 47.0 | 47.3 | 41.6 | 40.8 | 40.5 | 40.0 |
| Export% | 25.7 | 27.8 | 27.7 | 29.5 | 30.0 | 29.5 |
| Total crops% | 72.7 | 75.1 | 69.3 | 70.3 | 70.5 | 69.5 |

| | 1983/84 | 1984/85 | 1985/86 | 1986/87 | 1987/88 | 1983/88 |
|---|---|---|---|---|---|---|
| Food % | 44.4 | 50.0 | 54.7 | 58 | 57.7 | 53.7 |
| Export% | 27.1 | 23.6 | 20.1 | 17.9 | 17.8 | 21.2 |
| Total crops % | 71.5 | 73.6 | 74.8 | 75.9 | 75.5 | 74.9 |

% of sub-sector in agriculture (based on current value)

| | 1988/89 | 1989/90 | 1990/91 | 1991/92 | 1992/93 | Average 1988/92 |
|---|---|---|---|---|---|---|
| Food % | 48.5 | 49.0 | 47.8 | 50.3 | 48.9 | 48.9 |
| Export % | 22.1 | 15.8 | 15.3 | 17.6 | 17.1 | 17.2 |
| Total crops % | 70.6 | 64.8 | 63.1 | 67.9 | 66.0 | 66.1 |

Source: Based on Table 2 above

**Table 4**: Share of agricultural exports in total exports (%)

| Year Crop | 70/71 | 71/72 | 72/73 | 73/74 | 74/75 | 75/76 | 76/77 |
|---|---|---|---|---|---|---|---|
| Cocoa and cocoa pro | 30.2 | 26.6 | 24.0 | 29.7 | 36.8 | 26.7 | 26.6 |
| Robusta and arabica coffee | 24.6 | 23.4 | 29.3 | 25.1 | 19.3 | 30.3 | 32.2 |
| Logs and wood pro | 9.9 | 12.3 | 13.9 | 16.1 | 11.2 | 12.6 | 12.9 |
| Cotton | 7.1 | 4.3 | 4.2 | 3.0 | 2.7 | 3.8 | 3.8 |
| Others | 10.4 | 12.4 | 11.0 | 11.9 | 13.1 | 10.5 | 9.4 |
| Agric exports | 82.2 | 79.9 | 82.4 | 85.8 | 83.1 | 83.9 | 84.9 |

Source: Cameroon CEM 1980; Note: Annuelle de Statistique 1975-82.

| | 77/78 | 78/79 | 79/80 | 80/81 | 81/82 | 82/83 | 83/84 | 84/85 | 85/86 |
|---|---|---|---|---|---|---|---|---|---|
| Cocoa and cocoa products | 36 | 31 | 20 | 13 | 9 | 9 | 10 | 10 | 12 |
| Robusta and arabica coffee | 28 | 25 | 23 | 14 | 9 | 11 | 11 | 10 | 14 |
| Logs and wood products | 12 | 11 | 11 | 7 | 5 | 4 | 3 | 3 | 4 |
| Cotton | 3 | 3 | 4 | 3 | 3 | 3 | 2 | 1 | 2 |
| Others | 7 | 6 | 4 | 2 | 3 | 2 | 2 | 2 | 3 |
| *Agricultural* exports | 87 | 76 | 62 | 46 | 30 | 28 | 28 | 27 | 36 |

Source: World Bank, Cameroon Agricultural Sector Report, Vol II, Washington, D.C. Nov. 1989. central statistics

| | 86/87 | 87/88 | 88/89 | 89/90 | 90/91 | 91/92 | 92/93 |
|---|---|---|---|---|---|---|---|
| Cocoa and cocoa products | 16 | 14 | 12.5 | 8.0 | 8.2 | 6.5 | 6.1 |
| Robusta and arabica coffee | 15 | 12 | 11.1 | 7.3 | 8.3 | 5.9 | 4.8 |
| Log and wood products | 5 | 5 | 9.5 | 8.9 | 10.3 | 10.9 | 11.6 |
| Cotton | 2 | 2 | 5.3 | 5.9 | 4.0 | 4.2 | 3.1 |
| Others | 4 | 6 | 3.1 | 2.5 | 3.8 | 6.0 | 5.8 |
| Agriculture Exports | 42 | 48 | 41.5 | 32.6 | 34.6 | 33.5 | 31.4 |

Source: Adopted from D.P.; DSCN and Central Statistics.

## Export and food crops

The per capita income was highest in 1984/85 (406,000 CFA francs in nominal value), but has been falling ever since. In 1990/91 it was as low as 249,000 CFA francs (Table 6). Although a large share of domestic food consumption is provided from domestic food production, there is a decline in staple food supply (Table 7). The situation is worsening if seen in the light of per capita food production. Consequently, the overall living standards of Cameroonians may be falling. The food situation becomes an important issue in policy discussion.

From the colonial period to the present, food production has received very little attention. It has been left to small scale producers. The government neglect of the food sub-sector shows in the lack of public resources allocated to it. The bias has continued also because the principal producers of food are small holders who have no voice in public policy decision making, though some small-scale producers also raise export crops. The government derives much benefit from the export sub-sector, so directs resources to it at the expense of the food sub-sector. With the depressed world market prices for agricultural export crops, small-scale producers are shifting their resources into non-agricultural activities and export crop production. Hence food crops may tend to compete with export crop production.

**Table 5:** Share of agricultural crops in agricultural exports (%)

| Year crop | 70/71 | 71/72 | 72/73 | 73/74 | 74/75 | 75/76 | 76/77 |
|---|---|---|---|---|---|---|---|
| Cocoa and cocoa products | 36.7 | 33.7 | 29.1 | 34.6 | 44.3 | 31.8 | 31.3 |
| Robusta and arabica coffee | 29.9 | 29.5 | 35.6 | 29.3 | 23.2 | 36.1 | 37.9 |
| Logs and wood products | 12.0 | 15.6 | 16.9 | 18.8 | 13.5 | 15.1 | 15.2 |
| Cotton | 8.6 | 5.4 | 5.1 | 3.5 | 3.2 | 4.5 | 4.5 |
| Others | 12.7 | 15.6 | 13.3 | 13.8 | 15.8 | 12.5 | 11.1 |
| Agricultural exports | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Table 5**: Continued

| | 1977/78 | 1978/78 | 1979/80 | 1980/81 | 1981/82 |
|---|---|---|---|---|---|
| Cocoa and cocoa products | 42 | 40 | 32 | 32 | 30 |
| Robusta and arabica coffee | 33 | 33 | 37 | 36 | 31 |
| Logs and wood products | 14 | 15 | 18 | 17 | 17 |
| Cotton | 3 | 4 | 6 | 9 | 12 |
| Others | 8 | 8 | 7 | 6 | 10 |
| Agricultural export | 100 | 100 | 100 | 100 | 100 |

| | 82/83 | 83/84 | 84/85 | 85/86 | 86/87 | 87/88 |
|---|---|---|---|---|---|---|
| Cocoa and cocoa products | 31 | 37 | 37 | 34 | 38 | 30 |
| Robusta and arabica coffee | 39 | 39 | 38 | 40 | 36 | 25 |
| Logs and wood products | 14 | 9 | 12 | 12 | 11 | 11 |
| Cotton | 10 | 8 | 4 | 5 | 5 | 4 |
| Others | 7 | 7 | 8 | 8 | 11 | 13 |
| Agricultural export | 100 | 100 | 100 | 100 | 100 | 100 |

| | 1988/89 | 1989/90 | 1990/91 | 1991/92 | 1992/93 |
|---|---|---|---|---|---|
| Cocao and cocoa products | 30.1 | 25.3 | 23.8 | 19.5 | 19.5 |
| Robusta and arabica coffee | 26.8 | 22.5 | 24.1 | 17.5 | 15.2 |
| Log and wood products | 23.0 | 27.3 | 29.7 | 32.5 | 37.0 |
| Cotton | 12.7 | 17.1 | 11.5 | 12.6 | 9.9 |
| Others | 7.4 | 7.8 | 10.9 | 17.9 | 18.4 |
| Agricultural exports | 100 | 100 | 100 | 100 | 100 |

Source: World Bank, Cameroon Agricultural Sector Report, Vol. II, Washington D.C., Nov 19889, Ministry of Agricultural and Central Statistics

**Table 6:** Per capita income (current CFA francs) for period 1970/71 to 1990/91.

| Year | 1970/71 | 1971/72 | 1972/73 | 1973/74 | 1974/75 | 1975/76 |
|---|---|---|---|---|---|---|
| Per capita income | 47749 | 51602 | 56671 | 68020 | 78184 | 86441 |
| Year | 1976/77 | 1977/78 | 1978/79 | 1979/80 | 1980/81 | 1981/82 |
| Per capita income | 103080 | 121179 | 139947 | 168005 | 208793 | 246126 |
| Year | 1982/83 | 1983/84 | 1984/85 | 1985/86 | 1986/87 | 1987/88 |
| Per capita income | 229414 | 337396 | 405993 | 382918 | 340194 | 304316 |
| Year | 1988/89 | 1989/90 | 1990/91 | | | |
| Per capita income | 291333 | 263798 | 248534 | | | |

Source: *Annuaire Statistique du Cameroon,* 1983 *Comptes Nationaux du Cameroon Rapport* (CEREE), Ministry of Planning and Regional Development, 1992.

**Table 7**: Food Crops Production (In metric tons) in traditional sector (% changes from previous years)

| Year Crops | 1972/73 | 1973/74 | 1974/75 | 1975/761976/77 | 1977/78 | |
|---|---|---|---|---|---|---|
| Cassava | 97.5 | 113.4 | 110.6 | 172.4 | 125.5 | 122.4 |
| Plaintains | 110.1 | 105.8 | 120.4 | 283.0 | 102.2 | 104.7 |
| Taro and cocoyams | 105.8 | 97.9 | 136.1 | 290.4 | 105.7 | 107.0 |
| Bananas | 101.9 | 100.5 | 100.6 | 107.8 | 99.6 | 107.3 |
| Yams | 125.8 | 105.6 | 102.2 | 221.3 | 102.6 | 104.6 |
| Potatoes | 124.1 | 104.4 | 97.8 | 276.1 | 83.7 | 112.4 |
| Maize | 99.8 | 107.9 | 122.0 | 175.6 | 70.4 | 102.5 |
| Millet and Sorghum | 94.6 | 96.3 | 118.4 | 112.2 | 95.0 | 83.6 |
| Rice less semry | 63.9 | 134.2 | 202.9 | 124.2 | 160.7 | 89.1 |
| Groundnuts | 108.5 | 105.0 | 94.8 | 104.1 | 116.9 | 93.1 |
| Beans Pears | 106.9 | 111.8 | 108.4 | 244.2 | 82.2 | 101.7 |
| Sugarcane | 95.2 | 111.9 | 130.5 | 211.3 | 104.6 | 102.8 |
| Palm oil | 95.5 | 84.8 | 107.7 | 94.0 | 90.2 | 101.4 |

**Table 7:** Continued

| Year<br>Crop | 1978/ 79 | 1979/ 80 | 1980/ 81 | 1981/ 82 | 1982/83 | 1983/ 84 | 1984/ 85 |
|---|---|---|---|---|---|---|---|
| Cassava | 41.8 | 101.7 | 97.2 | 102.1 | 81.3 | 267.1 | 220.4 |
| Plaintains | 72.6 | 102.2 | 99.2 | 102.9 | 73.2 | 54.8 | - |
| Taro and cocoyams | 42.0 | 97.2 | 97.2 | 97.9 | 105.6 | - | - |
| Bananas | 72.4 | 99.9 | 73.1 | 89.0 | 103.2 | 149.9 | 103.5 |
| Yams | 48.3 | 101.9 | 99.0 | 95.3 | 88.4 | 30.8 | 159.6 |
| Potatoes | 25.1 | 95.7 | 102.9 | 102.1 | - | 28.9 | - |
| Maize | 84.0 | 101.7 | 100.7 | 103.5 | 115.5 | 83.3 | 99.8 |
| Millet and | 125.3 | 101.3 | 106.4 | 79.7 | 108.1 | 54.6 | 115.5 |
| Rice less semry | 106.4 | 32.9 | 32.9 | 111.0 | 188.2 | 53.0 | 25.2 |
| Groundnuts | 43.1 | 134.6 | 77.7 | 103.1 | 109.0 | 105.3 | - |
| Beans | 12.1 | 101.8 | 131.9 | 115.0 | - | - | - |
| Pears | | | | | | | |
| Sugar cane | 30.6 | 984.8 | 126.3 | 98.3 | 138.9 | - | - |
| Palm oil | 100.0 | 103.0 | 102.9 | 103.1 | 101.8 | - | - |

| Crops | 1985/86 | 1986/87 | 1987/88 | 1988/89 | 1989/90 | 1990/91 |
|---|---|---|---|---|---|---|
| Cassava | 109.1 | 99.8 | 89.3 | 88.0 | 146.9 | 91.8 |
| Plaintains | 125.5 | 105.8 | 72.4 | 90.0 | 133.0 | 76.5 |
| Taro and cocoyams | 461.2 | 93.0 | 89.4 | 93.6 | 109.0 | 28.9 |
| Bananas | 105.8 | 99.6 | 100.5 | 82.4 | 97.0 | 100.1 |
| Yams | 70.8 | 124.9 | 84.3 | 78.1 | 67.9 | 221.9 |
| Potatoes | 59.9 | 107.4 | 85.9 | 127.9 | 116.7 | 124.0 |
| Maize | 82.6 | 125.7 | 99.4 | 94.8 | 101.8 | 137.5 |
| Millet and | 166.6 | 160.0 | 43.6 | 177.0 | 82.1 | 90.3 |
| Rice (less semry) | 31.1 | 75.0 | 70.1 | 57.5 | 96.5 | 225.1 |
| Groundnuts | 103.2 | 97.5 | 85.6 | 94.7 | 93.7 | 152.1 |
| Beans | 108.1 | 108.9 | 65.0 | 146.8 | 91.5 | 116.7 |
| Pears | 70.4 | 140.9 | 61.0 | 155.4 | 85.1 | 367.5 |
| Sugar cane | 79.3 | 146.1 | 75.0 | 82.8 | 76.4 | 151.0 |
| Palm oil | 70.8 | 82.0 | 101.9 | 85.4 | 101.2 | 106.9 |

Source: Calculated from 1984 agricultural census of traditional agricultural sector, and 1985-1991 annual surveys of the traditional agricultural sector, Ministry of Agriculture, *Direction des Equete Agro-economique et de la Planification Agricole (DEAPA)*

**Table 8**: 1988/89 system and 1989/90 initial reforms (CFA francs per metric ton)

| Cocoa | 1988/89 | 1989/90 |
|---|---|---|
| Freight (forfeiture) | 24,779 | 24,779 |
| Insurance + "feinte" | 13,600 | 13,216 |
| Total | 38,379 | 37,995 |
| FOB | | |
| Transit expense | 3,833 | 3,283 |
| Charge bill of lading stamp | 167 | 167 |
| Port tax far | 1,267 | 1,395 |
| Scaling tax | 75 | 75 |
| Toll | 79 | 79 |
| Customs solicitor's fees | 450 | 450 |
| Shipment tax | 1,223 | 1,223 |
| Exportation duties | 56,000 | * |
| Specific tax | 1,000 | 1,000 |
| Drying tax | 875 | 875 |
| Phytosamitary tax | 50 | 50 |
| National council tax | 900 | 900 |
| Subtotal | 65,919 | 9,497 |
| Producer in Douala | | |
| Packing warehouse rent | 783 | 783 |
| F. Find/fd rolling | 6,258 | 3,875 |
| F. Find/security | 5,676 | 4,405 |
| (Weight loss) | 9,117 | 1,770 |
| Expense for gathering | 3,200 | 6,160 |
| Cooperative numeration | 4,500 | x |
| "Cashing" | 1,700 | x |
| Manipulating | 1,400 | 1,400 |
| Transport differential | 11,318 | 11,318 |
| Insurance against theft | 700 | 700 |
| General charges | 11,000 | 9,732 |
| Exporters benefit | 3,000 | 1,000 |
| Subtotal | 58,652 | 41,143 |
| Grand total | 162,950 | 88,635 |

Source: SOFRECO, 1991

**Table 9**: Resource flow between cocoa sub-sector and the state 1979 (in billions of CFA francs).

| | | | |
|---|---|---|---|
| Export taxes | 42.5 | Current expenditure | 4.3 |
| Withdrawal by NPMB | 30.0 | investment budget | 5.7 |
| | | NPMB Agri. budget | 15.0 |
| Total | 72.5 | | 25.0 |

Net contribution of main export crop 72.5-25 = 47.5 billion CFA

Source: Ministry of Agriculture, 1980, Bilan Diagnostic, p. 62

**Table 10**: Reserves of Caisse de stabilisation des prix au Producteurs (CSPP) in billion francs CFA.

| Year | 78/79 | 79/80 | 80/81 | 81/82 | 82/83 | | |
|---|---|---|---|---|---|---|---|
| Amount of reserves | 55.1 | 849 | 35.3 | 85.3 | 2.5 | | |
| Year | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| Amount of reserves | 7.8 | 35.1 | 63.4 | 83.9 | 85.3 | 70.2 | 65.7 |

Source: SOFRECO report, 1990. Export taxes not included.

## Export crop pricing

Government intervention in pricing and marketing of agricultural export crops has been relatively high in Cameroon. The government has set the producer price of the major export crops, regulated the marketing of these crops and set the distribution, tax and profit margins. Producer prices for cocoa, coffee and cotton are set yearly. The price shedule, called "bareme" (Table 8), sets the remuneration margins for each step of the marketing process. Producer prices have been set at low levels and falling world prices have not allowed increases in producer prices. The stabilization funds (estimated at 114 billion francs in 1985/86) could have covered the subsidy in principle. In practice, however, this amount did not and does not exist for the farm sector because it was diverted to other uses. So while export crops have provided huge resources to the government, the pricing system has not provided incentives to producers to increase production.

Up till 1991 when the structural adjustment program (SAP) reduced the export taxes, resources were heavily extracted from the export crop sub-sector. Export taxes

and withdrawals have been substantial. For the period 1970-1985, the withdrawals were on average 48% for cocoa and 46% for coffee, with very little plowed back into the sub-sector. Tables 9 and 10 show how much reserves or withdrawals the state took from the cocoa and coffee trade, excluding export taxes.

## Food crops

Untill recently the government has in principle regulated the marketing, transportation and prices of food-stuffs in Yaounde and Douala. This has not been effective. But price regulation has been applied effectively on a few crops - rice, flour, edible oils, sugar and bread. The prices have been fixed to cover the production costs, though most of these price-controlled products are produced by parastatals at very high costs. Tariffs have also been imposed to protect the domestic production of these so-called important products.

To a greater extent domestic rice production has not been competitive mainly because of very high official consumer prices and high transport costs from the producing zone (in the north) to the main consuming centres in the south of the country.

## Agricultural constraints

The performance of Cameroonian agriculture has been greately affected by many elements, including primary resources and institutional and infrastructural factors. The main resources used in agricultural production are land, labour, capital and water in the most general terms.

The land quality based on agroclimatic conditions is favourable for production of a great variety of crops. On the other hand, Cameroonian agriculture is a rainfed system, so that crop production is subject to the vagaries of climatic conditions. Moreover, the agricultural labour force is aging. The situation is worsened by migration of young people to non-agricultural areas -particularly to the cities. Labour shortages both in quantity and quality are a serious long-term problem, especially as Cameroon's agriculture is labour intensive.

Rudimentary impliments such as hoe and cutlass are predominantly used on farms. Bureaucratic obstacles are reflected in red-tape, long delays in decision making and interventionist and paternalistic policies that may leave farmers with no private initiative. The government has not provided the necessary public investment to give the right environment for increased agricultural activities. Some of the major other factors beside pricing that are highly condusive to agricultural production, but lacking in Cameroon, are infrastructure, inputs, information and institutional frameworks. These are discussed below.

## *Infrastructure*

Infrastructure that links production locations with other parts of the country, particularly consumption areas is important. Storage and transportation facilities including roads are essential for ensuring the movement of persons, goods and services from one place to another.

The lack of these structures leads to fragmented markets, since market signals are not effectively transmitted and responsiveness to price incentives is inhibited. All this limits the price mechanism from operating effectively. For example, in China agriculture improved significantly in the 1970s mainly because in the 1960s the Chineses government built an appropriate agricultural infrastructure (RAJ, 1991). Cameroon now suffers from deteriorating roads and lack of rural infrastructure. The total classified road network (paved and earth), which was 32,714 kilometers in 1982, has not increased (Amin, 1991). Since then, even the paved roads are deteriorating because of lack of maintenance.

In fact, the kilometers of classified road per head have declined. In 1981/82 the ratio was .0037 but in 1989/90 the ratio decreased to .003 (Amin, 1991). The limited road and railway infrastructure presents a great constraint to the agricultural sector in terms of the movement of goods and people. This makes it difficult for farmers to respond to production incentives.

## *Inputs*

The timely availability of inputs such as fertilizers, equipment and water permits the proper and efficient production of crops.

The agency in Cameroon which carried on research on farm equipment has been closed, and not much is now being done to improve the rudimentary equipment used by farmers. Less than 2% of Cameroon farmers owned/used machinery such as tractors, ploughs and sprayers, though the use of machinery is more common in the northern provinces. The small size of farms in the southern provinces to some extent limit the use of machinery. It may be that organizations like cooperatives can find ways to introduce and encourage the use of small farm equipment. While the majority of the farms in western province use much fertilizers, the other regions hardly use them at all.

## *Information networks*

The existence of information networks, such as research and extension services, to ensure the availability of necessary and appropriate technology is much lacking. There is very little applicability of research findings, and the link between the reseach institutions and small-scale farmers is weak. This leads to stagnant technology.

## Efficient institutional frameworks

A framework for providing marketing and credit services for proper performance of the commodity marketing system is non existent. With the collapse of commercial banking sector, which was not even geared towards encouraging the agricultural sector, the rural sector now depends mainly on the informal financial market.

Moreover, adequate nourishment and health and education facilities are essential for increasing labour productivity and hence food production. Human capital investment enhances productivity. It has been shown that persons who acquire primary education significantly increase their productivity. The economic crisis is having far-reaching effects on the rural population, with the result that human capital formation is being compromised. This is even reflected in the UNDP studies on Cameroon human development (PNUD, 1991, 1993).

## Overcoming constraint

These constraints inhibit agricultural production as well as the transmission of price signals to the producer. In fact, the non-price factors such as technological backwardness, limited or no access to required inputs, poor marketing facilities and inadequate transport are a major constraint to agricultural production.

Hence investment in research and technological change should simultaneously be done with the building of rural infrastructure, since social overhead capital (like roads, health, educatiion, etc) is very low in Cameroon's rural regions. The shortages of these public goods point out the crucial importance of government's policies towards the agricultural sector. Taxing agriculture or stabilizing producer prices must be fully judged with government's investment expenditures in agriculture, which can also offset the revenue extracted from Cameroon agriculture. Physical capacity development, institutional development and human capacity development are all interrelated as well, as they involve great social investments in roads, infrastructure, education and health facilities.

# VI. Theoretical models and formulas

The real exchange rate (RER) is critical in determining the profitability of both exportable and import-competing agriculture, since "RER measures the real terms of trade between traded and nontraded goods" (Oyegide, 1986, p. 42). If we assume the sensitivity of intra - and inter-sectoral resource flows to changes in relative prices, then changes in RER resulting from relative price changes would affect intersectorial profitability. This shifts resources between various sectors in the economy.

So an increase in RER would shift resources from non-tradeables to tradeables, and a decline in the RER would move resources from tradeables to non-tradeables. Changes in RER (terms of trade) are influenced also by export taxes, import tariffs and price policies.

In studying the trade, (real) exchange rate and price policies within the three-sector framework, it is usually assumed that excess supply and excess demand for tradeables and excess demand for non-tradeables are mainly a function of relative prices. This is because of the belief in the power of production incentives for shifting resources within and among economic activities. Hence the motivation for our measuring different relative prices and price intervention. For instance, an imposition of import taxes increase the domestic price of importable relative to exportables and non-tradeables. Producers therefore find it more profitable to produce importables while consumers switch to consumption of exportables and non-tradeables. But at the same time resources are induced to move into the local production of importables. This means a shortage in resources for the production of exportables and non-tradeables and increases in their prices. The process creates a final equilibrium where the price of the importables is less than the imposed tax since there has also been an increase in the price of non-tradeables and domestic price of exportables.

On the other hand, if export tax is imposed on export goods, this reduces the domestic price of the exportables relative to non-tradeables and importables. This results in an increase in domestic demand for exportables, but also leads to decreased production of exportables as resources shift to importables and non-tradeables. The process expands production in non-tradeables and importables and contracts exportables. There is then downward pressure on the price of non-tradeables and importables until a new demand and supply equilibrium is reached. The price of non-tradeables and importables decreases but not to the same extent as the imposed export tax. It should be noted that these three main sub-sectors can be divided further. But it is also very important to note that the lowering of the real exchange rate or over-valuation of the domestic curreny cannot be easily corrected by adjusting the nominal exchange rate alone. Instead, the correction

can be done by eliminating trade restrictions (Bautista, 1987, p. 50) and by looking at the fundamental problem.

## Data sources

Data on the relevant variables such as export taxes, nominal exchange rate, output prices, trade flows, tariff rates, government budget, main economic indicators, etc, were collected from a variety of sources. These included government statistical departments, various issues of IMF International Financial Statistics, FAO Trade Yearbook and National Produce Marketing Board documents. Other sources were relevant published and unpublished materials, reports and studies on the agricultural sector.

These were supplemented with other qualitative information based on interviews, questionaires and discussions. This study involved a large data requirement, especially for estimating the basic indexes and the determinants of RER. Our major source of data was the Cameroon Central Statistical Department.

We faced many problems in collecting the data series; some of the problems were due to change of methodology used for putting the data together. Some series are not complete, while some are not even available. In certain cases, for completeness we had to piece data from different sources into a single series or construct missing data points from other aggregates. In most cases the same data set or series (variables) from different sources were not consistent. Above all, the quality of much of the data was poor. Hence we have to interpret the result with care.

## Direct and indirect agricultural taxation

Besides the extensive literature on the direct effect of exchange rate policy on agriculture, there is a growing discussion of the indirect effect. The direct effect, by government intervention, is mainly through pricing policies.

In this section we derive formulas to assess the impacts of these policies on Cameroon's agricultural prices and products. These measures are partly based on those developed by Krueger (1988), Krueger *et al* (1991) and Elbadawi (1992). These permit an evaluation of how foreign price changes and trade policy affect agricultural price incentives.

Let $P_i$ be the producer price of agricultural tradeable good $i$ and $P_{fi}$ be its border price, while the official nominal exchange rate is $E$. $E$ is the amount of CFA francs per unit of foreign currency

The producer price can be affected directly by a variety of government policies, such as export taxes, stabilization fund, price fixing and marketing arrangements, as seen above. The extent of the total intervention can be measured in at least two ways:

a) *Nominal protection coefficient (NPC),* which is the ratio of producer price $(P_i)$ to the border price $(P_f)$ with adjustment made for transport, storage, and other costs. It

compares the price the producer receives to what the producer might have received in the absence of government intervention. It is written as:

$$NPC_i = P_i/P_{fi} \quad (1)$$

b) *Nominal protection rate (NPR)*, which is similar to NPC but measures the percentage difference between the border price ($P_{fi}$) and the producer price. It is wrtten as:

$$NPR = \frac{P_i - P_{fi}}{P_{fi}} \quad (2)$$

This could be redefined to take into consideration the transport-adjusted border price at the official exchange rate; the direct nominal protection rate is:

$$NPR_D = \frac{P_i / P_{NA} - P_{fi} / P_{NA}}{P^*_{fi} / P^*_{NA}} \quad (3)$$

Where $P_{NA}$ is the non-agricultural sector price index and the starred variables are evaluated at the nominal exchange rate.

$NPR_D$ therefore computes the impact ($P_i$ - $Pf_i/P_{NA}$) of the direct policies as a proportion of $P_i/P_{NA}$ - the relative price prevailing in the absence of all interventions.

In calculating $NPR_D$, the official exchange rate is used. Only the direct effects of trade policy are measured.

The indirect nominal protection rate ($NPR_i$) measures the effect of the nominal exchange rate ($E$) deviation from the equilibrium exchange rate ($E^*$) on non-agricultural tradeables. That is:

$$NPR_i = \frac{P^*_{fi} / P^*_{NA}}{P_{fi} / P_{NA}} - 1 \quad (4)$$

This is a measure reflecting the nominal rates of protection adjusted by sectoral and economy-wide policies. It combines both the sectoral effects and economy-wide price interactions on agricultural prices.

## Effective exchange rates

The effective exchange rates for importable ($E_m$) and exportable ($E_x$) goods can be

measured using the following formulas:

$$E_x = E(1-t_x) \tag{5}$$

$$E_m = E(1+t_m) \tag{6}$$

where $t_x$ and $t_m$ are the export tax rate and import tariff rate, respectively. This could also be used for each exportable agricultural good. We could also compute a more generalized effect of trade policies on foreign exchange prices by weighting the tariff on import and taxes on exports.

## Trade bias index

We use a trade bias index *(TBI)* to compute the aggregate incentives reflected in the trade regime. *TBI* indicates the degree to which the trade regime promotes or discourages the production of export goods vis-a-vis imports. We express *TBI* as $E_x/E_m$.

$$TBI = E_x/E_m = (1 - t_x) / (1 + t_m) = 1 \tag{7}$$

Trade is encouraged when this measure is greatest than one and so exports are promoted against import substitution and vice versa.

Within the tradeable goods category there may be some goods that are more favoured than others. We use effective exchange rate for each group to identify the more favoured group:

$$E_j/E_i, \text{ if } E_j/E_i > 1 \tag{8}$$

then $j$ is being promoted relative to $i$. Product-specific price effects of trade policy are used within a group of commodities. Using the domestic price relative to border price of $i$ and $k$ yields:

$$(P_i/P_k) / (Pf_i/Pf_k) \tag{9}$$

e.g; cocoa *(i)* and coffee *(k)*

## Tradeables

We define the domestic prices of exportables $(P_X)$ – what the producer receives of importables $(P_m)$ – what the consumer pays; and of tradeables $(P_T)$, as follows:

$$P_x = E(1 - tX)\, P^*_x \tag{10}$$

$$P_m = E(1 + t_m) P^*_m \quad (11)$$

$$P_T = P^{ab}_x P^{1-ab}_m \quad (12)$$

where $0 < ab > 1$

Note that $P^*_x$ and $P^*_m$ are world prices and exports and imports, respectively. Inserting equations 10 and 11 into equation 12, and taking natural logs on both sides, we have

$$In\ P_T = In\ E + ab\ In\ (1 - t_x) + ab\ In\ P^*_x + (1-ab) In\ (1+t_m) + (1-ab) In\ P^*_m \quad (13)$$

Hence $P_T$ depends on exchange rates, trade policy and foreign prices.

## Non-tradeables

In a competitive market situation the price and quantity sold are determined by market forces; with the law of one price holding at equilibrium, the quantity supplied would equal the quantity demanded. We can therefore simply derive the price of the non-tradeable sector $(P_N)$ from the expenditure identity based on national accounts data (Devarajan *et al*; 1991, p. 13). We can calculate the price level of non-tradeables from the expenditure identity: total value of gross domestic products is equal to the total value of non-tradeables plus total value of exports.

$$\text{GDP. Deflator} = P_N N + P_x x$$

$$\text{Hence,} \quad P_N = \frac{GDP.Deflator - P_X X}{(gdp - x)} \quad (14)$$

Many other indexes have been suggested as proxy for the non-traded goods price. Indexes such as a national consumer price index are not available in Cameroon. Instead, consumer price indexes are available for Yaounde and Douala; these can be used to calculate the real exchange rate, but there are problems of inclusion.

We have also used other indexes as proxies for the price of non-tradeables. These indexes are a construction index and an index for electricity, gas and water. We regard these as non-tradeables in that prices are mainly determined by domestic demand and supply. However, there are usual problems of poor coverage and measurement in constructing these indexes.

## Real exchange rates

There are various definations of real exchange rate (RER), which may give rise to different

implications and problems. The government through the monetary authorities determines the nominal exchange rate, which may give room for potential distortion as reflected in over-valuation. Cameroon belongs to the franc zone and therefore pegs its currency to the French franc at a fixed nominal rate. This does not, however, guarantee the stability of the nominal exchange rate against other currencies.

In neoclassical trade theory, the real exchange rate is regarded as the ratio of the price of tradeable $(P_T)$ to that of non-tradeable goods $(P_N)$. This measure does on the whole help in analysing the resource flow and determining the cost of producing tradeable goods relative to non-tradeable goods. It takes into consideration importables, exportables and home goods. Thus the definition reflects the incentive structure that encourages the allocation of resources across these sectors. $P_T/P_N$ not only summarizes how resources are allocated domestically in these sectors, it also gives an index to judge the extent to which a country's tradeable sector is internationally competitive.

The major limitation of this definition are the problems of obtaining the appropriate data and the difficulty of distinguishing between tradeables and non-tradeables. For instance, Devarajan and de Melo (1978) calculated RER on the basis of national accounts. They regarded agriculture and industry as the tradeable sector and the rest of the economy as non-tradeables. This is subject to many problems. One big problem is separating the tradeables from the non-tradeables among and within sectors. It is hard to say which sector is dominantly tradeables or non-tradeables, as they did. This is different from equation 14, which is based on a general equilibrium model with three goods — exports, imports and domestic goods.

Cameroon's exportables are mainly primary goods and some light manufactured goods, and imports are mostly intermediates and capital goods with very few domestic substitutes. Hence, aggregating those to a tradeable sector may distort our view of Cameroon's adjustment process in response to changes in terms of trade. Traditionally, the definition of RER has tended to rely on the purchasing power parity (PPP) approach, where RER is the product of the nominal exchange rate and some foreign price index divided by the domestic price index. There are measuring problems and problems in the choice of the variables, and PPP may greatly differ with RER (Tshibaka, 1991).

## Equilibrium RER

Another problem is being able to pinpoint the equilibrium RER; since discussion on competitiveness of export implies that the RER is out of equilibrium or is misaligned. Both external and domestic economic environments change, and the structure of the economy changes with time. Consequently, the RER would have different equilibrium from a given benchmark year. In order to adjust the exchange rate, the policy makers need to know the equilibrium exchange rate and by how much it has changed. RER says nothing about under-or over-valuation. It only shows that RER fluctuates around a certain base level. In effect we are assuming that a certain RER was correct in the past or it was at an equilibrium that may not even be known - but if known could become a basis for a

target since RER per se is not controlled by the government. Instead, in order to maintain a target RER, changes in the nominal exchange rate could be coupled with monetary and fiscal policy measures. Within the BEAC zone, Cameroon cannot make any arbitrary changes in its nominal exchange rate; it can only carry out internal adjustments such as fiscal policy measures or changes in domestic cost structure.

## Estimating RER

In estimating the RER and calculating the extent of the over-valuation we try to use different definitions of RER, partly to cross-check each other and to show how they differ from each other. The most commonly used one is defined as

$$RER = EP_T/P_N \tag{15}$$

This is the relative incentive between tradeables and non-tradeables in the domestic economy, written as $P_T/P_N$ and $P_N$ should be an index of domestic currency, so that the foreign currency prices are calculated in domestic prices using the nominal exchange rate $(E)$. Thus, $RER = EP_T/P_N$ where $P_T$ is the index of foreign prices of tradeable goods.

Since the trading partners are involved, we can use the multilateral formula below. In this case, $E$, $P_T$ and $X$ are the nominal exchange rate, index of tradeables and weight of trading partner $i$, respectively, and $N$ is number of trade partners. Thus:

$$RER = \frac{\sum_{i=1}^{N}(X_i, E_i, P_{iT}) / N}{P_N} \tag{16}$$

RER is also used to measure Cameroon's agricultural competitiveness. Other measures of a country's competitiveness, such as unit cost of labour, are highly unreliable in Cameroon mainly because of the dearth of data. Hence for internal consistency in our calculation of $P_N$ based on Equation 14, we also use both export price $(P_x)$ and import price $(P_m)$ indexes as the numerator to actually calculate the RER.

## Incentive structure and model derivation

To determine the effects of the real exchange rate (RER) as a price incentive, we need to develop certain price relations. For convenience, we classify the economy into three main markets -domestic non-tradeables, exports and imports. This classification could be extended into six or more categories (Fosu, 1992), namely, non-agricultural non-

tradeables (NAN), agricultural non-tradeables (AN), agricultural exports (AX), non-agricultural exports (NAX), agricultural imports (AM) and non-agricultural imports (NAM). (Non-tradeables are wholly produced and consumed domestically. Exportables are goods whose domestic production is greater than domestic consumption and importeables are goods with domestic production less than domestic consumption).

We assume that local supply and demand conditions determine the prices of non-tradeables, while prices of exportables and importables (tradeables) are directly related to their world prices. We have seen, above, the relationship between foreign prices of both exportables and importables and domestic prices.

We examined the price relationships among and within the importables, exportables and non-tradeable sectors. The relative prices among these goods indicate the relative incentives to producers as well as relative costs to consumers. Thus they determine the demand for and supply of these goods and the movement of resources. We could therefore use the Cobb-Douglas type functions to represent the aggregate prices. That is:

a. Price of non-tradeables $(P_N)$ as aggregate of agricultural non-tradeable price $(P_{AN})$ and non-agricultural non-tradeable $(P_{NAN})$

$$P_N = P^{a}_{NAN} P^{1-a}_{AN} \tag{17}$$

b. Agricultural price $(P_A)$ as an aggregate of non-tradeable agricultural price $(P_{AN})$, agricultral export price $(P_{AX})$ and agricultural import price $(P_{AM})$.

$$P_A = P_{AX}^{b} P_{AM}^{\alpha} P_{AN}^{1-b-\alpha} \tag{18}$$

c. Non- agricultral price $(P_{NA})$ as aggregate price of non-agricutral exports $(P_{NAX})$, price of non-agricultural imports $(P_{NAM})$ and price of non-agricultural non-tradeables $(P_{NAN})$.

$$P_{NA} = P_{NAX}^{a} P_{NAM}^{b} P_{NAN}^{1-a-b} \tag{19}$$

d. Price of tradeable goods $(P_T)$ as an aggregate of export price $(P_x)$ and price of imports $(P_M)$.

$$P_T = P_x^{ab} \quad P_m^{1-ab} \tag{20}$$

These relationships reflect the composition of the aggregate prices. They could be used to estimate the prices and relative prices that depend on the trade and exchange rate policies. In short, the relationships are embedded in the incidence model we use in

analysing proportional changes in the price of different groups of commodities relative to others. The incidence model is specified in natural logarithms to estimate the price relationship. Thus:

$$ln(P_N/P_X)=ln\ a + h_1\ ln(P_M/P_X)+h_2\ ln\ TBR + h_3 InPc + e \quad (21)$$

Where *TBR* is the balance of trade variable defined as the ratio of trade balance (exports - imports) to export and $P_c$ is the productive capacity variable defined as real GDP. *TBR* and $P_c$ are regarded as shifters, while $h_1$ indicates the combined effects of commercial and exchange rate policies on the tradeable and non-tradeable sectors. This is a highly aggregated general equilibrium model of three goods - importables, exportables and non-tradeables (with their respective prices) - that is complemented with detailed inferences. The estimation is on time series data, so that real income is not constant, and neither is there a balanced external account over time.

## Agricultural exports responses to RER

Although there is an extensive literature on supply response, there are different views on the responsiveness of agricultural crop to price. These views range from emphasis on individual agricultural commodities to aggregate supply responses and Oyejide (1990) has concisely discussed these problems. In this study we also analyse the response of two main export crops to changes in relative prices and indirectly to RER.

Cocoa and coffee are produced mainly for export. The quantity exported is, therefore, a good approximation of the amount produced. We would, however, analyse the total agricultural exports response to relative prices. Comparing the value of foreign currency with that of domestic currency, the domestic currency in terms of its real purchasing power is here expressed as real exchange rate. Hence, to estimate the effects of RER on agricultural exports, we do so indirectly through price incentives.

Implicit models are as follows:

$$X_{it} = f(X_{it}-1, \frac{P_i}{P_N}, \frac{P_i}{P_{NA}}, \text{ trend, weighted income of importer, error term}) \quad (22)$$

$$X_{jt} = f(X_{jt}-1, \frac{P_j}{P_N}\ \ \frac{P_j}{P_{NA}}\ \text{trend, weighted income of trading partners, error term}) \quad (23)$$

where $i$ = cocoa, coffee

$j$ = agricultural exports, non-agricultural exports and
$X$ = export crop.

## VII. Empirical results

The nominal protection coefficient for the length of the period is less than one for the three major export crops — cocoa, arabica and robusta coffee. That is, the producer has consistently been receiving 50% or less of the FoB price (Table 11 and figure 1).

An estimation of the nominal protection rate (Table 12) yields similar results. This also shows the degree of price distortion or total intervention in two major export crops — cocoa and coffee.

A highly over-valued exchange rate coupled with trade and pricing policies results in a strong disincentive for the production of these agricultural export crops. Throughout the period, the indirect effects on the incentives are much greater than the direct effects. In all, the total effects are very large as seen in the cocoa example (Table 13) where we attempt to separate the total intervention into direct and indirect effects. The direct effects result from trade restrictions and commercial policy; indirect effects result mainly from exchange rate misalignment. This high level of agricultural taxation results from exchange rate and trade policies that also induced high relative prices of domestic goods.

As seen in Figure 2 and Table 14, the price of agricultural exports relative to prices of non-tradeables have declined since the mid 1970s. This indicates that the relative price of exports have fallen over time; for the period of the real over-valuation of CFA franc, we would expect a decline in the production of tradeable goods. The implication is that the prices of non-tradeables have been increasing, consequently resources must have been induced into the non-tradeable sector.

There is a similar situation with the price of agricultural exports $(P_{AX})$ relative to the price of food $(P_{food})$. As from 1979, the price of food increased relative to the price of agricultural exports (Table 15). As the price of domestically produced and consumed food increased, more resources shifted into this sub-sector relative to the agricultural export sector, since food activities became more rewarding.

The effective exchange rates for importables $(E_M)$ and exporteables $(E_x)$ are measured on the basis of import tariffs and export tax rates. Our estimates show that $E_m$ is higher than $E_x$, consequently the overall trade bias index $(E_x/E_m)$ is less than one for each year for the period 1971-1992. From Table 16 we observed that the importables are highly protected relative to exportables. But this has indirectly produced negative effects on the production of exporteables. Resources are instead diverted to import substitutes and non-tradables. This index is highly aggregative and shows the extent to which the trade regime has discouraged the production of exportables relative to importables.

**Table 11**: Nominal protection coefficient for cocoa ($C_o$), arabica ($C_a$) and robusta ($C_r$) coffee exports

| Year | $NPC_{co}$ | $NPC_{ca}$ | $NPC_{cr}$ |
|---|---|---|---|
| 1963 | 0,598 | 0,882 | 0,634 |
| 1964 | 0,800 | 0,814 | 0,739 |
| 1965 | 0,825 | 0,766 | 0,819 |
| 1966 | 0,354 | 0,783 | 0,671 |
| 1967 | 0,359 | 0,830 | 0,975 |
| 1968 | 0,274 | 0,810 | 0,719 |
| 1969 | 0,357 | 0,771 | 0,709 |
| 1970 | 0,590 | 0,725 | 0,801 |
| 1971 | 0,664 | 0,589 | 0,635 |
| 1972 | 0,402 | 0,665 | 0,613 |
| 1973 | 0,396 | 0,616 | 0,625 |
| 1974 | 0,361 | 0,676 | 0,646 |
| 1975 | 0,508 | 0,725 | 0,566 |
| 1976 | 0,429 | 0,667 | 0,747 |
| 1977 | 0,285 | 0,337 | 0,619 |
| 1978 | 0,324 | 0,352 | 0,342 |
| 1979 | 0,393 | 0,538 | 0,359 |
| 1980 | 0,496 | 0,413 | 0,529 |
| 1981 | 0,636 | 0,505 | 0,444 |
| 1982 | 0,650 | 0,526 | 0,444 |
| 1983 | 0,455 | 0,582 | 0,609 |
| 1984 | 0,439 | 0,410 | 0,450 |
| 1985 | 0,437 | 0,373 | 0,394 |
| 1986 | 0,444 | 0,337 | 0,345 |
| 1987 | 0,587 | 0,645 | 0,434 |
| 1988 | 0,654 | 0,646 | 0,417 |
| 1989 | 0,861 | 0,652 | 0,704 |
| 1990 | 0,792 | 0,591 | |
| 1991 | 0,746 | 0,312 | |
| 1992 | 0,667 | 0,415 | |
| 1993 | 0,440 | 0,425 | |

**Figure 1**: NPC for Cocoa, arabica, robusta exports

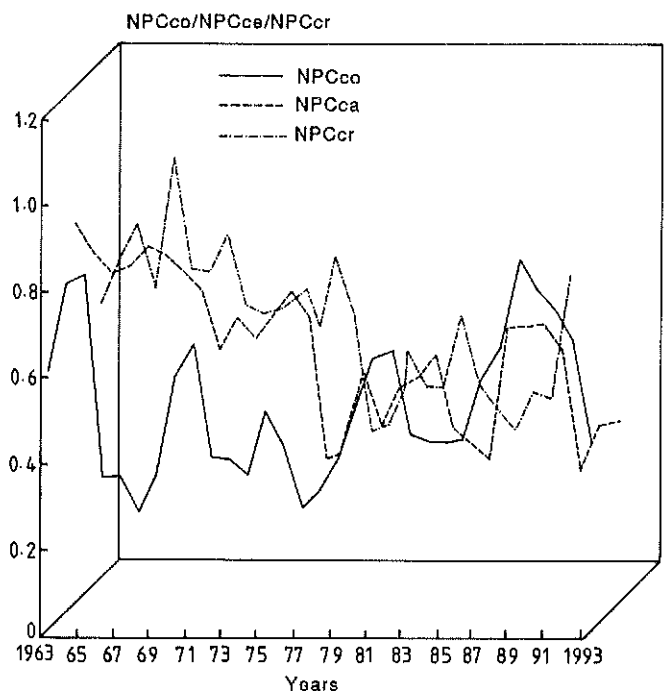
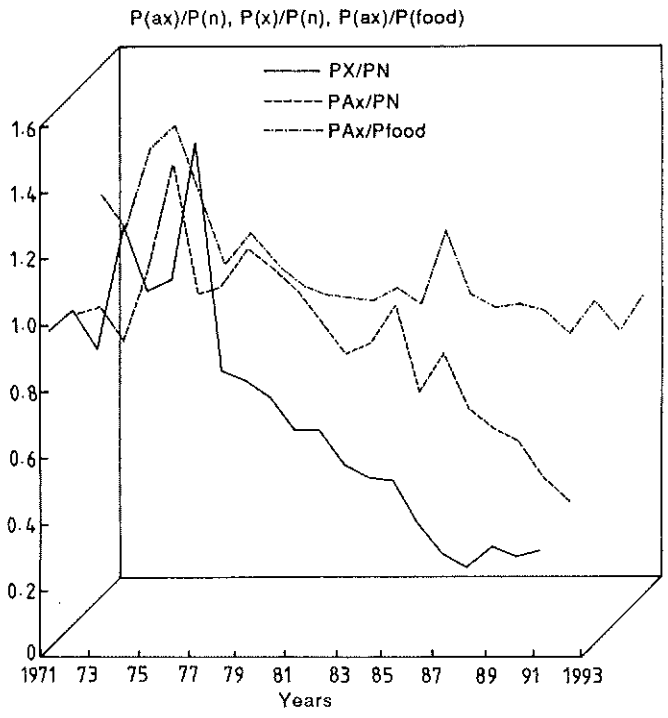



**Figure 2**: PX, PAx, relative to PAx/P (food)



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| 1984 | 0,439 | 0,410 | 0,450 |
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| 1987 | 0,587 | 0,645 | 0,434 |
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| 1991 | 0,746 | 0,312 | |
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| 1993 | 0,440 | 0,425 | |

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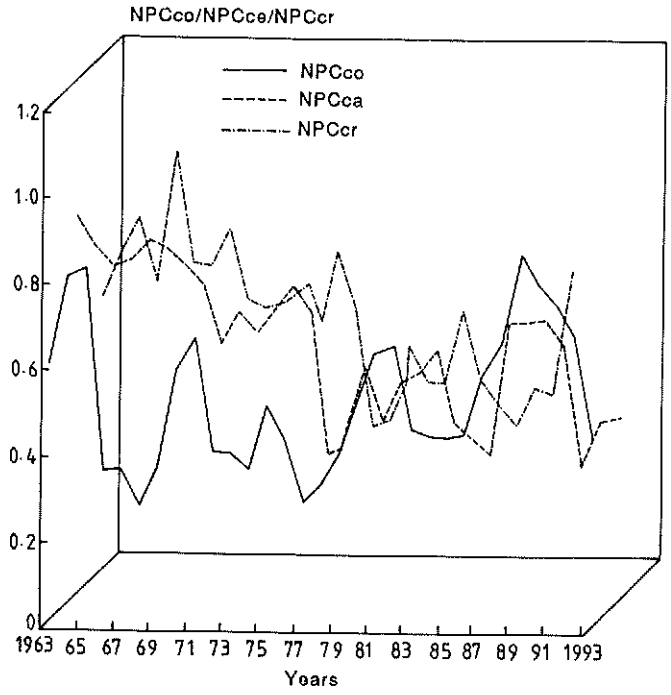


**Figure 2**: PX, PAx, relative to PAx/P (food)

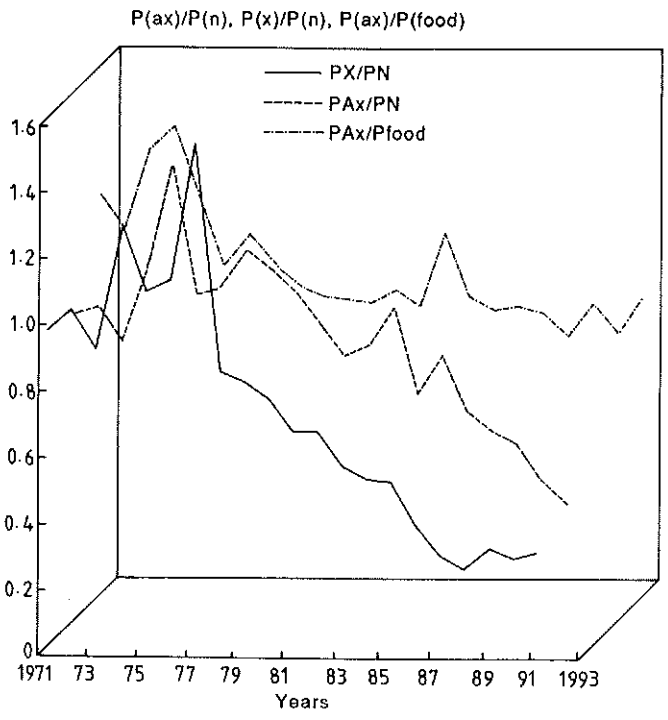

**Table 12**: Nominal protection rates for cocoa, and coffee ( robusta and arabica)

| | $NPR_{Arabica}$ | $NPR_{Robusta}$ | $NPR_{Cocoa}$ |
|---|---|---|---|
| 1971 | -0.412 | -0.365 | -0.336 |
| 1972 | -0.335 | -0.387 | -0.598 |
| 1973 | -0.384 | -0.375 | -0.604 |
| 1974 | -0.544 | -0.354 | -0.559 |
| 1975 | -0.275 | -0.434 | -0.492 |
| 1976 | -0.333 | -0.253 | -0.571 |
| 1977 | -0.663 | -0.381 | -0.715 |
| 1978 | -0.648 | -0.658 | -0.676 |
| 1979 | -0.462 | -0.641 | -0.607 |
| 1980 | -0.587 | -0.471 | -0.504 |
| 1981 | -0.495 | -0.556 | -0.364 |
| 1982 | -0.474 | -0.556 | -0.350 |
| 1983 | -0.418 | -0.391 | -0.545 |
| 1984 | -0.590 | -0.550 | -0.561 |
| 1985 | -0.627 | -0.606 | -0.563 |
| 1986 | -0.663 | -0.655 | -0.556 |
| 1987 | -0.355 | -0.566 | -0.413 |
| 1988 | -0.354 | -0.583 | -0.346 |
| 1989 | -0.348 | -0.296 | -0.139 |
| 1990 | -0.409 | -0.401 | +0.232 |
| 1991 | -0.688 | -0.630 | -0.254 |
| 1992 | -0.587 | -0.550 | -0.333 |

Source: Author's estimates

**Table 13:** Direct and indirect effects for cocoa

| Year | Direct (%) | Indirect (%) | Total (%) |
|---|---|---|---|
| 1971 | -9.3 | -24.3 | -33.6 |
| 1972 | -28.4 | -31.4 | -59.8 |
| 1973 | -21.1 | -39.3 | -60.4 |
| 1974 | -25.4 | -30.5 | -55.9 |
| 1975 | 21.1 | 28.1 | -49.2 |
| 1976 | -25.8 | -32.9 | -58.7 |
| 1977 | -26.2 | -45.3 | -71.5 |
| 1978 | -24.4 | -43.2 | -67.6 |
| 1979 | -20.3 | -40.3 | -60.6 |
| 1980 | -17.3 | -33.1 | -50.4 |
| 1981 | -14.1 | -22.3 | -36.4 |
| 1982 | -11.7 | -23.3 | -35.0 |
| 1983 | -22.3 | -32.2 | -54.5 |
| 1984 | -17.2 | -38.9 | -56.1 |
| 1985 | -20.2 | -36.1 | -56.3 |
| 1986 | -20.4 | -35.2 | -55.6 |
| 1987 | -10.0 | -31.3 | -41.3 |
| 1988 | -13.9 | -21.2 | -34.1 |
| 1989 | -3.3 | -10.6 | -13.9 |
| 1990 | -6.8 | +30.0 | +23.2 |
| 1991 | -5.1 | -20.3 | -25.4 |
| 1992 | -12.1 | -21.2 | -33.3 |

Source: Author's estimates

**Table 14**: Price of exports, ($P_X$) agricultural exports ($P_{AX}$)relative to price of non-tradeables $P_N$ and $P_{AX}/P_{food}$.

| Year | $P_X/P_N$ | $P_{AX}/P_N$ | $P_{AX}/P_{food}$ |
|---|---|---|---|
| 1971 | .96 | 0.93 | 1.21 |
| 1972 | 1.025 | 0.954 | 1.11 |
| 1973 | .905 | 0.85 | 1.35 |
| 1974 | 1.274 | 1.06 | 1.42 |
| 1975 | 1.08 | 1.38 | 1.22 |
| 1976 | 1.115 | 0.99 | 1.00 |
| 1977 | 1.52 | 1.015 | 1.1 |
| 1978 | 0.84 | 1.13 | 0.99 |
| 1979 | 0.81 | 1.07 | 0.94 |
| 1980 | 0.76 | 1.00 | 0.91 |
| 1981 | 0.66 | 0.905 | 0.90 |
| 1982 | 0.66 | 0.81 | 0.89 |
| 1983 | 0.56 | 0.84 | 0.93 |
| 1984 | 0.52 | 0.955 | 0.88 |
| 1985 | 0.51 | 0.695 | 1.1 |
| 1986 | 0.38 | 0.815 | 0.91 |
| 1987 | 0.29 | 0.645 | 0.87 |
| 1988 | 0.25 | 0.585 | 0.88 |
| 1989 | 0.31 | 0.55 | 0.86 |
| 1990 | 0.28 | 0.44 | 0.79 |
| 1991 | 0.30 | 0.37 | 0.89 |
| 1992 | | | 0.80 |
| 1993 | | | 0.91 |

Source: Author's estimates

**Table 15**: Effective exchange rates and trade indexes

| Year | EX | EM | TBI |
|---|---|---|---|
| 1971 | 245.284 | 361.036 | .674 |
| 1972 | 222.182 | 330.745 | .671 |
| 1973 | 196.143 | 289.757 | .676 |
| 1974 | 202.188 | 308.096 | .656 |
| 1975 | 188.593 | 285.032 | .661 |
| 1976 | 210.232 | 315.414 | .666 |
| 1977 | 221.112 | 330.842 | .667 |
| 1978 | 216.634 | 327.207 | .662 |
| 1979 | 208.466 | 268.027 | .777 |
| 1980 | 190.152 | 270.438 | .700 |
| 1981 | 244.557 | 339.663 | .720 |
| 1982 | 315.456 | 400.904 | .786 |
| 1983 | 365.818 | 457.272 | .800 |
| 1984 | 423.851 | 524.352 | .810 |
| 1985 | 440.274 | 539.112 | .816 |
| 1986 | 339.374 | 398.245 | .852 |
| 1987 | 294.529 | 360.648 | .815 |
| 1988 | 279.979 | 306.786 | .912 |
| 1989 | 293.572 | 328.58 | .893 |
| 1990 | 295.613 | 404.949 | .73 |
| 1991 | 294.914 | 403.991 | .73 |
| 1992 | 289.817 | 408.192 | .71 |

Source: Author's estimates

**Table 16**: Product-specific price effects

| | Cocoa/arabica | Cocoa/robusta | Arabica/robusta |
|---|---|---|---|
| 1971 | 0.55 | 0.68 | 1.24 |
| 1972 | 0.55 | 0.72 | 1.32 |
| 1973 | 0.51 | 0.69 | 1.35 |
| 1974 | 0.50 | 0.74 | 1.48 |
| 1975 | 0.51 | 0.83 | 1.62 |
| 1976 | 0.43 | 0.67 | 1.56 |
| 1977 | 0.46 | 0.60 | 1.30 |
| 1978 | 0.61 | 0.79 | 1.29 |
| 1979 | 0.74 | 0.84 | 1.13 |
| 1980 | 0.85 | 0.91 | 1.06 |
| 1981 | 0.88 | 0.94 | 1.09 |
| 1982 | 0.84 | 0.94 | 1.12 |
| 1983 | 0.80 | 0.94 | 1.17 |
| 1984 | 0.82 | 0.95 | 1.15 |
| 1985 | 0.88 | 0.98 | 1.10 |
| 1986 | 0.88 | 0.95 | 1.08 |
| 1987 | 0.88 | 0.95 | 1.08 |
| 1988 | 0.88 | 0.95 | 1.08 |
| 1989 | 0.88 | 0.95 | 1.08 |
| 1990 | 0.88 | 0.95 | 1.08 |
| 1991 | 1.00 | 1.61 | 1.61 |
| 1992 | 0.85 | 1.33 | 1.58 |
| 1993 | 0.60 | 1.00 | 1.67 |

Source: Author's estimates

**Table 17**: Trend of RER

| Explanatory Independent variable | Dependent Variable model | $RER_1$ 1 | $RER_2$ 2 | $RER_3$ 3 | $RER_4$ 4 | $RER_5$ 5 |
|---|---|---|---|---|---|---|
| Trend (T) | | -16.85 | -6.29 | -20.54 | -3.27 | -.53 |
| | | (-4.1) | (-1.12) | (-3.79) | (-1.5) | (-7.90) |
| Constant | | 591 | 495 | 691.1 | 359.12 | 56.38 |
| | | (11.44) | (7.0) | (10.12) | (13.12) | (66.95) |
| $R^2$ | | .67 | .26 | .53 | .21 | .87 |

t-statistics are in parenthesis.

Even examining the effects of pricing policy on the two major export crops — cocoa and coffee — the estimates of the price ratios show that generally more encouragement has been given to coffee than to cocoa, and within the coffee category arabica coffee is promoted much more than robusta. However, these perennial crops are region specific. The geographic and climatic or ecological conditions favouring their growth are different in their specific regions. It is difficult, for instance, to grow cocoa in the same region with arabica coffee. But certain resources, such as labour and finance could be shifted to the region if there were greater incentives to do so.

For the period 1971-1992 the real exchange rate (RER) showed a declining trend, as seen in the regression estimates in Tables 8.1. We have five measures of RER that are each regressed against time (T). The t-statistics are in parentheses and T is the trend term. The decline of the RER means that there has been a real appreciation of the CFA franc or over-valuation of the domestic currency and consequently under-valuation of the foreign currency — the US dollar. All the different measures of RER move together, and RER, $RER_6$ and $RER_7$ are similar so that any of the measures could be used. We therefore use the $EP_X/P_N$ to calculate the degree of over-valuation

| | | |
|---|---|---|
| $P_T$ | = | Simple average price of exports and imports |
| $P_{NE}$ | = | Index for electricity, water and gas |
| $P_{NC}$ | = | Construction index |
| $P_{tr}$ | = | Weighted price index for 3 major trading partners |
| $P_D$ | = | Cameroon domestic price index |
| $P_X$ | = | Price of exports |
| $P_m$ | = | Price of imports |
| $CPIF$ | = | France Consumer price index |
| $CPIC$ | = | Cameroon consumer price index |
| $P_N$ | = | Price of non-tradeable sector |

$$E\frac{P_T}{P_N} = RER_1 \quad ; \quad E\frac{P_T}{P_{NE}} = RER_2$$

$$E\frac{P_T}{P_{NC}} = RER_3 \quad ; \quad E\frac{P_{ft}}{P_D} = RER_4$$

$$50\frac{CPIF}{CPIC} = RER_5 \quad ; \quad E\ P_X / P_N = RER_6, \quad ; \quad EPm / P_N = RER_7$$

**Table 18**: Average annual rate of (real exchange rate)— over-valuation*

| Period | Average annual rate (Over-valuation) (%) |
|---|---|
| 1971-1975 | -44.7 |
| 1976-1982 | -9.8 |
| 1984-1985 | 33.6 |
| 1986-1990 | 75.0 |
| 1991-1992 | 77.1 |

Source: Author's estimates
Notes: *The calculation is based on 1983 as the equilibrium period using $EP_X/P_N$ = RER

Our estimates in Table 18 show that the real exchange rate was below the equilibrium by an average annual rate of 44.7% for the period 1971 - 1975 and 9.8% for the period 1976 - 1982. The estimates show that the degree of Cameroon's export competitiveness decreased towards the equilibrium, which is estimated to be in 1983. The RER declines particularly after 1985 (Table 19 and Figure 3).

The same period also shows a sharp decline of the nominal exchange rates (Table 2 and Figure 4). For 1984-1985, the NER was 33.6%; for the period 1986-1990, it was 75%. By 1991-1992, it had reached 77.3%. The very high level of over-valuation (especially for the period 1986-1992) demontrates the extent to which Cameroon's agricultural exports were badly hurt.

Prior to 1984, commodity prices were high, contributing to increased production, and the government generated large reserves (Table 11) through its marketing board pricing policy (Table 8). This is also seen from the nominal protection coefficients (Table 9) for the different export crops, which are by far less than one. Yet there was incentive to produce these crops partly because some inputs to producers were subsidized. It

**Figure 3**: Real exchange rate

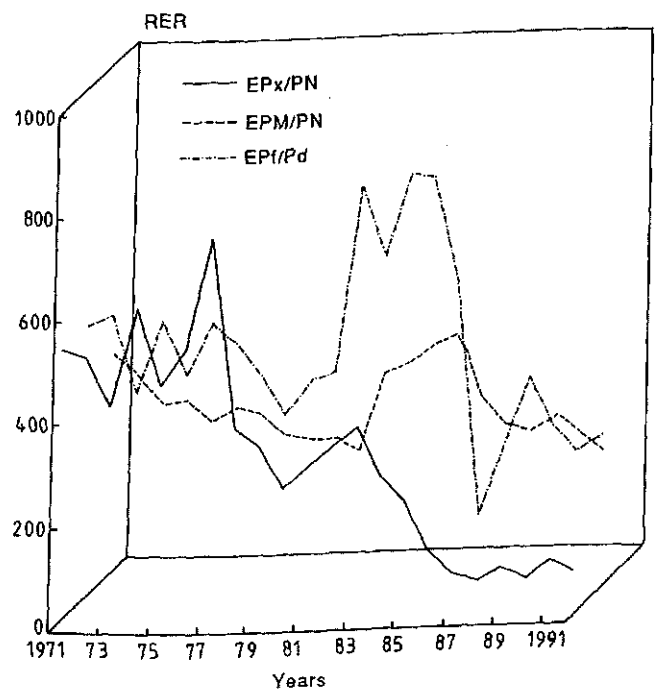


**Figure 4**: CFA relative to naira and US dollars

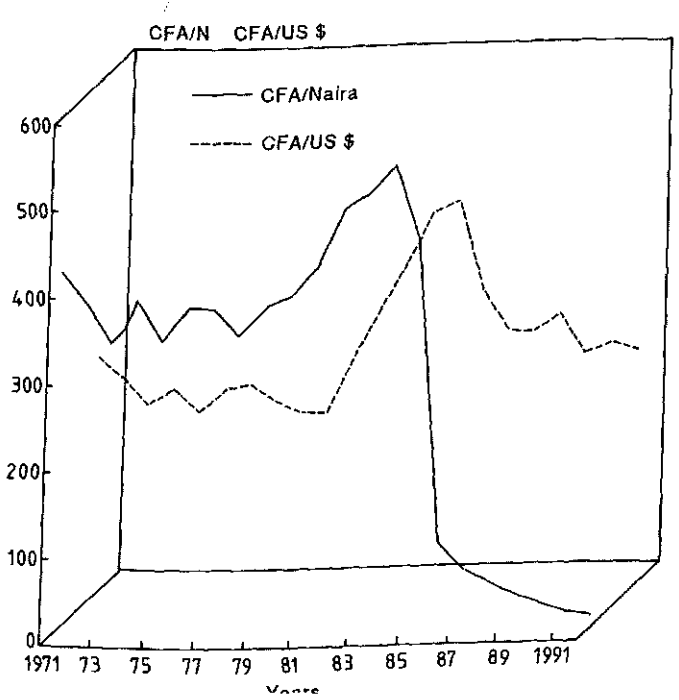

**Table 19**: Real exchange rate (RER)

| | $P_N$ | $P_X$ | $P_m$ | $EP_X/P_N$ | $EP_m/P_N$ | $EP_f/P_D$ |
|---|---|---|---|---|---|---|
| 1971 | 34.81 | 67.32 | 66.86 | 532.99 | 529.99 | 427.18 |
| 1972 | 32.24 | 66.14 | 70.43 | 517.96 | 551.55 | 383.77 |
| 1973 | 39.64 | 75.5 | 71.40 | 424.52 | 401.47 | 329.88 |
| 1974 | 42.21 | 107.68 | 94.72 | 614.04 | 540.13 | 336.98 |
| 1975 | 53.79 | 116.07 | 109.19 | 462.45 | 435.03 | 295.75 |
| 1976 | 58.76 | 131.23 | 131.38 | 533.65 | 534.26 | 320.19 |
| 1977 | 60.94 | 185.55 | 126.18 | 746.31 | 494.76 | 307.10 |
| 1978 | 72.76 | 122.83 | 139.58 | 380.94 | 432.89 | 266.128 |
| 1979 | 85.44 | 138.29 | 142.98 | 344.50 | 355.97 | 255.26 |
| 1980 | 87.79 | 109.24 | 174.61 | 262.90 | 420.22 | 255.65 |
| 1981 | 144.07 | 125.13 | 182.39 | 300.27 | 434.48 | 238.79 |
| 1982 | 135.50 | 141.28 | 326.25 | 342.37 | 791.21 | 377.90 |
| 1983 | 144.77 | 143.92 | 248.66 | 378.82 | 654.52 | 396.30 |
| 1984 | 181.41 | 115.11 | 337.46 | 277.26 | 812.84 | 428.22 |
| 1985 | 207.99 | 106.28 | 372.12 | 229.56 | 803.78 | 449.26 |
| 1986 | 201.99 | 77.22 | 349.59 | 132.39 | 599.35 | 325.52 |
| 1987 | 228.82 | 67.17 | 112.24 | 88.22 | 147.42 | 273.49 |
| 1988 | 247.72 | 60.86 | 236.62 | 73.18 | 284.50 | 256.15 |
| 1989 | 217.57 | 67.3 | 279.89 | 98.68 | 410.39 | 283.92 |
| 1990 | 240.64 | 66.26 | 281.11 | 74.97 | 318.04 | 250.48 |
| 1991 | 227.93 | 88.69 | 213.23 | 110.69 | 266.13 | 261.72 |
| 1992 | 240.10 | 75.5 | 261.11 | 86.65 | 299.69 | |
| 1993 | 250.20 | 78.9 | 271.5 | | | |

Source: Author's estimates

should also be noted that this period was characterized by relatively low inflation rates. But beginning in the early 1980s the general price level started increasing, perhaps due to increased domestic spending on non-productive projects. As both the export prices and domestic prices are directly linked to the real exchange rate, these events greatly affected the real exchange rate. The impact of over-valuation is therefore seen among the three major sectors —exportable, importable and non-tradeable — and within the sectors.

Furthermore, as in Table 21, we attempted to quantify the relatiionship between the relative prices and the real exchange rate, and trade policy. We examined the cocoa price relative to prices of non-tradeable goods, $t_x$ and $t_m$, which are obtained by using the ratio of export tax and import tax revenues to total export and import revenues, respectively. The t-statistics in the parentheses are low. However, the results show that the real exchange rate has effects on the relative prices. For example, a 10% rise in the real exchange rate (i.e, 10% depreciation of the real exchange rate) stimulates about 1.9% increase in the price of cocoa to the price of non-tradeables. As we take the export taxes and then both export and import taxes into consideration, the percentage increase is .76% and .67% respectively.

**Table 20**: Exchange rate between Cameroon and Nigeria and US currencies (CFA/Naira, CFA/US dollar)

| Year | CFAN | CFAD |
|---|---|---|
| 1971 | 417.6 | 275.60 |
| 1972 | 382.6 | 252.48 |
| 1973 | 337.7 | 222.89 |
| 1974 | 388.2 | 240.70 |
| 1975 | 340.2 | 214.31 |
| 1976 | 379.4 | 238.95 |
| 1977 | 378.0 | 245.68 |
| 1978 | 347.2 | 225.66 |
| 1979 | 379.8 | 212.72 |
| 1980 | 391.3 | 211.28 |
| 1981 | 424.5 | 271.73 |
| 1982 | 490.4 | 329.61 |
| 1983 | 508.1 | 381.06 |
| 1984 | 539.5 | 436.96 |
| 1985 | 449.3 | 449.26 |
| 1986 | 104.3 | 346.30 |
| 1987 | 72.6 | 300.54 |
| 1988 | 55.7 | 297.85 |
| 1989 | 41.7 | 319.01 |
| 1990 | 30.3 | 272.26 |
| 1991 | 20.5 | 284.48 |
| 1992 | 15.5 | 275.58 |

Source: International financial statistics Cameroon central statistics office

**Table 21**: Relative prices

Dependent variable = $P_{co}/P_N$ (relative price of cocoa to price of non-tradeables)

| Explanatory variables | Model 1 | 2 | 3 |
|---|---|---|---|
| Constant | .482 | .541 | .83 |
| | (3.32) | (3.115) | (2.98) |
| RER | .092 | 0.078 | .067 |
| | (2.85) | (2.67) | (1.98) |
| 1-tx | - | .12 | .112 |
| | | (1.61) | (2.110) |
| 1+tm | - | - | .07 |
| | - | - | (2.91) |
| $R^2$ | .431 | .391 | .345 |
| DW | 1.62 | 1.57 | 1.58 |

t- statistics are in parentheses

**Table 22**: Incidence coefficient estimates

| Explanation Variables | 1 | 2 | 3 |
|---|---|---|---|
| Constant | .595<br>(4.65) | 2.49<br>(1.954) | 5.45<br>(1.77) |
| ln $P_M/P_X$ | .705<br>(8.95) | .546<br>(3.595) | .411<br>(2.193) |
| ln $P_c$ | – | .387<br>(2.651) | .419<br>(1.951) |
| ln TBR | – | – | –.598<br>(–2.119) |
| $R^2$ | .795 | .805 | .855 |
| DW | 2.45 | 2.50 | 2.15 |
| F Statistics | 2.45 | 2.50 | 28.67 |

Sample period 1966-1993

From Table 22, it is seen that the incidence parameter is as high as .705 and reduces as $P_c$ and *TBR* are added to the regression. $P_c$ represents per capita income and *TBR* is the ratio of trade balance to exports (exports - imports divided by exports). With successive adding of $P_c$ and *TBR*, the $R^2$ is increased while t-value in parentheses are reduced. This was also an attempt to correct for any simultaneity bias.

The estimates of the first model indicate that a 10% increase in the price of imports $(P_m)$ relative to the price of exports $(P_x)$ would increase the price of the non-tradeables $(P_N)$ relative to the price of exports by 7.1%.

The negative coefficient of *TBR* may indicate the negative influence of the trade balance on domestic prices. However, the results of these estimated equations show that the exchange rate and trade policies are biased against exportables (particularly agricultural exportables) relative to imports. Consequently, there are greater incentives to produce non-tradeable goods and substantial disincentives to export production.

Three agricultural export models were estimated with ordinary least squares method. The dependent variables were cocoa $(Q_{co})$, arabica coffee $(Q_{cca})$ and agricultural export $(Q_{AX})$. The right hand variables include a weighted income of major Cameroon trading partners $(Y_{tp})$ and other variables as specified. The results reported here are all in natural logarithm (Table 23) so the coefficient can be interpreted as elasticities.

Overall the variables are not statistically significant at the 5% level although they have the right signs. The prices of cocoa and coffee relative to the prices of non-tradeables have negative coefficients. This is likely because any increase in the price of

**Table 23**: Estimates of agricultural exports response

| Explanatory variable | Dependent variable | $Q_{co}$ | $P_{cea}$ | $Q_{AX}$ |
|---|---|---|---|---|
| Constant | | 10.135 | 5.8 | 4.61 |
| | | (3.60) | (2.5) | (2.143) |
| $Q_{co-1}$ | | .3615 | - | |
| | | (1.47) | | |
| $P_{co}/P_N$ | | -.298 | - | |
| | | -(1.508) | | |
| $P_{co}/P_{NA}$ | | .567 | - | |
| | | (1.804) | | |
| $Y_{tp}$ | | .276 | .047 | .307 |
| | | (1.49) | (2.97) | 2.09) |
| $Q_{cea-1}$ | | - | .276 | |
| | | | (0.49) | |
| $P_{cea}/P_N$ | | - | -.746 | |
| | | | (1.467) | |
| $P_{cea}/P_{NA}$ | | - | .694 | |
| | | | (1.676) | |
| $Q_{AX-1}$ | | | | .686 |
| | | | | (2.86) |
| $P_{AX}/P_N$ | | | | -.472 |
| | | | | -(1.940) |
| $P_{AX}/P_{NA}$ | | | | .506 |
| | | | | (2.110) |
| DW | | .84 | .69 | .98 |
| Adj. $R^2$ | | .29 | .19 | .48 |

t -Statistics are in parentheses. Sample period 1966-1993

non-traded goods relative to the prices of the agricultural prices reduces the value of the respective ratios.

The response of cocoa and coffee to foreign income is fairly elastic for cocoa and fairly inelastic for coffee. The volume of coffee may not increase when the income of trading partners increases. A 10% increase in the income of trading countries would increase only coffee exports by .47%, while cocoa would increase by 2.76%.

On the whole, an improvement in the income of Cameroon's trading partners (by 10%) would tend to increase agricultural exports (by 3.07%).

# VIII. Conclusion and policy implications

The agricultural sector is heavily taxed through a high level of intervention, mainly taxation or government intervention and over-valuation. The levels of real over-valuation are quite high — up to 77%. Estimates show that a 10% depreciation of RER stimulates about 1.0% increase of cocoa relative to the price of tradeables. The producers of cocoa and coffee, the products with the most intervention, receive less than 50% of the FoB prices. The overall trade index shows a bias against exports, most of which are agricultural. This bias is clearly seen in the incidence coefficient estimates, which show an incidence parameter as high as .705. That is, a 10% increase in the price of imports relative to the price of exports tends to increase the price of non-tradeables relative to the prices of exports by 7.1%. The relation between the price of agricultural exports and the price of food also shows that food prices have increased relative to agricultural export prices. One would therefore expect a shift of resources towards the non-tradeable sector. These results are similar to others (Krueger, 1991; Wlebelt, 1992), although the degree of agricultural taxation in Cameroon tends to be much higher.

The removal of these interventions is absolutely necessary for better performance of the agricultural sector and the economy as a whole. First, the removal of the negative price intervention would have a negative fiscal effect since the interventions are actually a source of revenue. A new revenue system could be instituted to replace the existing distortionary pricing system that is biased against small-scale agricultural producers. One example might be introducing a progressive tax schedule that allows producers to acquire reasonable profits as incentives to increase production and productivity.

Second, because of the very high level of over-valuation, it is necessary to strongly consider the question of devaluation. This should include looking at factors that increase the price of non-tradeables and major agricultural constraints. In particular, the factors that have reduced agricultural exports and prices should be examined. Measures should be taken to improve agricultural performance partly by removing these agricultural constraints. The government must increase expenditure on rural and export infrastructure, lower trade taxes and maintain a realistic exchange rate, yet looking at the fiscal deficits. The real exchange rate policy should be complemented with other policy measures.

# Appendix

## Cameroon trade with Nigeria

The exchange rate evolution between the Naira and CFA franc can be divided into many periods. The years 1961 to 1966 had a constant exchange rate. The naira was over-valued relative to the CFA franc between 1967 and 1971, as well as between 1979 and 1984. The naira was depreciated in 1972 and 1978 and again in 1985 and 1990. The naira witnessed a sharp depreciation as from 1987.

The periods of over-valuation of the naira corresponds to the time when Cameroon's exports to Nigeria were almost double the amount of imports from Nigeria. For instance, in 1983/84 Cameroon exported goods that amounted to CFA9,314 million and imported only CFAF1,250 million. On the other hand, the periods of devaluation (or depreciation of the naira) correspond to the periods when Cameroon imported more than she exported to Nigeria. The 1987 to 1990 period was characterized by this phenomenon.

Unit prices per ton of exports were generally higher than the unit prices of imports for the 1983/84 to 1991/92 period. This probably suggests that Cameroonian exports were sold at a higher price in the Nigerian markets than the Nigerian exports in the Cameroonian markets. This contributed to Cameroonian exports being less competitive in Nigerian markets and even inside Cameroon. The unit price per ton has been higher for exports than for imports since 1987, showing that the naira devaluation discourages exports to Nigeria but on the other hand encourages imports into Cameroon. In recent years there has been a massive importation of Nigerian goods into Cameroon. Such goods include electronic and radios, vehicles, household items, foodstuffs and medicines. Cameroon exports to Nigeria constitute mainly primary goods such as rice, fresh vegetables, etc.

It is too early now to assess the impact of the January 1994 devaluation of the CFA francs by 50% relative to the French franc. Noting that, Nigeria immediately depreciated the naira relative to the CFA franc.

## Postscript: January 1994 Devaluation

In January 1994, the CFA countries, which include Cameroon, devaluated the CFA franc by 50% relative to the French franc. The parity between the French and the CFA franc became 100 CFA franc to 1 French franc. Indirectly, the CFA franc became devaluated

relative to the other world currencies including the Nigerian currency, the naira.

The 50% devaluation was across the board for all 30 countries belonging to the CFA franc zone. Within the franc zone there are different real exchange rates partly because the different countries have different fiscal and trade regimes. The cost and price structures also differ from country to country. Nominal devaluation across the board becomes highly problematic. However, different measures could be taken in the respective countries to reduce the negative effects of such devaluation.

It is true the CFA was over-valued, but without any proper studies and appropriate measures taken it is feared that the present devaluation programme may lead to greater hardships. Casual observation has shown that there has been a rapid increase in prices of goods particularly in imported goods and those with imported components. These increases have also affected the prices of non-tradeable goods. In all, the general price level is increasing, which may lead to another devaluation. The major problem is that there were no detailed studies including a simulation excercise to evaluate the impact of such devaluation. Besides nominal devaluation, real devaluation would have involved a thorough examination of the cost and price structures, and the government's spending to avoid a failed devaluation programme, which may lead to further devaluation.

However, appropriate fiscal and monetary measures including public discussion could still be taken to address the problem. There is need now more than before for much public discussion on the evaluation issue. I finished writing up this study in December 1993, before the 12 January 1994 devaluation.

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